(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 142 748**
B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication of patent specification: 27.07.88

(51) Int. Cl.⁴: E 05 B 73/00

(21) Application number: 84113110.5

(22) Date of filing: 31.10.84

(54) **A lock for securing a mark especially onto a textile article.**

(30) Priority: 04.11.83 DK 5064/83

(43) Date of publication of application:
29.05.85 Bulletin 85/22

(45) Publication of the grant of the patent:
27.07.88 Bulletin 88/30

(84) Designated Contracting States:
AT BE CH DE FR GB IT LI NL SE

(56) References cited:
GB-A-2 021 675
US-A-3 858 280
US-A-3 953 990
US-A-4 069 919
US-A-4 088 228
US-A-4 305 266
US-A-4 311 883

(73) Proprietor: Antonson Security Denmark A/S
"Lynggaarden", Tjaereby
DK-4000 Roskilde (DK)

(72) Inventor: Braun, Herman
28, Manzanita Lane
Santa Barbara California 93105 (US)

(74) Representative: Dipl.-Ing. H. Hauck Dipl.-Phys. W. Schmitz Dipl.-Ing. E. Graalfs Dipl.-Ing. W. Wehnert Dr.-Ing. W. Döring
Mozartstrasse 23
D-8000 München 2 (DE)

EP 0 142 748 B1

Courier Press, Leamington Spa, England.

Description

The present invention relates to a lock preferably for a burgular alarm for marking articles for sale, said lock comprising two members automatically interengaging when one member is inserted in a cavity in the other member wherein said first member comprises a rod-shaped body, the inserting end of which is completely or partially pointed, said rod-shaped body engaging a third member loosely inserted in the cavity in the second member, wherein a spring with an upward elastic force is situated in the cavity below the loosely inserted third member, and wherein the inner sides of the cavity incline towards the inlet of the cavity, the third member being provided with means adapted to cooperate with a corresponding inner surface of the second member on one side and to engage the rod-shaped body on another side so as to be pressed against said body in case the latter is subjected to a pull.

When ensuring articles for sale against burglary it is important that the markers are easy to mount on the articles for sale and can be removed only by an authorized person such as a shop assistant. The available markers are encumbered with the problem that the first member for instance shaped as a solid drawing pin sometimes can be pulled out of the lock merely by subjecting the head of the "drawing pin" to an upward pull.

A lock as defined above has become known from US—A—3 858 280. In such lock the means that can cooperate with the inclined inner surface of the second member and the rod-shaped body comprise a pair of balls disposed in grooves in the second member on opposite sides of the rod-shaped body. The balls contact the inclined inner walls of the cavity and are pressed against said walls when the rod-shaped body is pulled outwards.

It is a primary object of the present invention to provide a lock which is simple and inexpensive to manufacture and which is easy for authorized persons to open by means of special equipment or tools, but which is difficult to open without said special equipment or tools.

According to the present invention a lock of the above defined type is characterized in that said means consists of an oblique upward projection integral with the third member and inclined so as to be slidable along said inclined surface of the second member, said projection being provided at the top with a bending forming a barb and the rod-shaped body of the first member comprising a notch cooperating with the rim of the barb.

In this manner a locking effect is obtained between the two members. When the first member is inserted in the cavity of the second member, said first member presses the third, loosely positioned member slightly aside and a short distance downwards whereafter the point of the first member passes the third member. The spring in the bottom ensures that the third member does not fall to the bottom of the cavity but instead is pressed upwards towards the top of the cavity pointed upwards. If it is tried to pull out the first member again, a friction between the first member and the third member ensures that said third member is pulled upwards too and thereby inwards as a consequence of the inclined surfaces. In this manner the third member fastens tighter on the first member, and any upward pull only fixes the first member tighter. The lock can only be released by the inner loose third member being pressed downwards against the force of the spring therebelow.

The third member may advantageously be made of a magnetizable material and the second member may be made of a non-magnetizable material such as plastics. In this manner the lock can be released by positioning the marker over a suitably strong magnet attracting the third member, whereby the magnet must be so strong that it can overcome the spring force.

The lock may, however, also be released in another manner. The top side of the second member may be completely or partially provided with hidden openings allowing the third member to be pressed into the cavity by means of an implement in such a manner that the first member can be removed from the lock.

According to the invention the loosely positioned third member may be shaped as a disc with an inclined upward projection, one surface of which forms one of the cooperating surfaces. As a result, a simple embodiment is obtained suited to be manufactured from a magnetizable steel alloy. The inclined upward projection on the third member may be provided with a bending forming a barb, and the rim of this barb may towards the first member be shaped as part of a circular arc with a radius fitting the radius of the rod-shaped body of the first member. The rod-shaped body of the first member may advantageously comprise a notch forming a cut cooperating with the rim and shaped as a circular arc of the projection. In this manner an efficient engagement of the first and the third member is ensured.

The second member may comprise two ultrasonically welded plastic portions, viz. an upper portion and a lower portion, and the lower portion may be cast with an upwardly inclined plastic flap forming the spring supporting the loosely positioned third member, whereby a very simple and inexpensive manufacture is rendered possible.

The invention will be described below with reference to the accompanying drawings, in which

Figure 1 is a sectional view through an embodiment of a lock according to the invention,

Figure 2 is a sectional view corresponding to Figure 1, where the lock is opened,

Figure 3 illustrates a lock with an opening for an implement for releasing the lock,

Figure 4 illustrates the V-shaped resilient member pressing a disc with a locking pin upwards.

Figure 1 illustrates a lock according to the invention. The lock comprises a first member 1 in

the form of a steel pin with a plastic head. The pin is pointed at the inlet end and comprises a turned, narrowed portion 2. The lock furthermore comprises a second member 5, 6 inserted in a marker for a burglar alarm on an article for sale. The marker is preferably made of plastics in two portions 3, 4 with a cavity receiving the second member 5, 6. When the second member has been inserted, the two portions 3, 4 of the marker are assembled, for instance by ultrasonic welding, into an inseparable unit. Alternatively, the marker may be cast or pressed about the second member of the lock. The second member of the lock comprises two portions 5, 6 preferably made of plastics. These two portions are also assembled by ultrasonic welding and surround a cavity 7. A movable third member 8 is positioned in this cavity. This movable member is a disc 9 with a pressed projection or flap 10 that is bent at its upper end to form a barb 16 which can be directed towards the first member.

In the preferred embodiment the disc 9 is made of a hardened and magnetizable steel. The lower portion 6 of the second member is shaped during the casting with a pressed flap 11 forming a spring in the bottom of the lock. The spring presses the movable disc 9 upwards. The cavity 7 is greatest in the lower portion 6 of the second member, where both the loose, movable disc 9 and the spring 11 can be positioned. The cavity is so high that the disc 9 with the projection 10 can be pressed a substantial distance downwards, under a suitably strong downward influence, said distance corresponding to almost half the length of the upward projection 10. The bottom of the cavity is insignificantly bigger than the disc. As illustrated in Figure 2, a displacement of the third member 8 along the sliding surface on the projection 10 implies that the disc is carried into the bottom of the lock. The side surface 12 of the lower portion of the second member facing the cavity is in the illustrated embodiment provided with the same inclination as the upward projection of the third member 8. To the right in Figure 1, the disc 9 is of such dimensions that it almost touches the above side surface. When the third member 8 is pressed downwards, e.g. when subjected to a magnetic force, the disc is displaced a short distance to the left and released from the first member, cf. Figure 2. The uppermost portion of the cavity 7 can receive the upward projection 10 of the third member 8 and comprises an inclined, planar or conical wall so that the cavity 7 is pointed upwards. The projection 10 may comprise a planar side or a curved surface such as for instance a circular, cylindrical or conical surface, and this surface is tangent to the inner wall of the upper portion of the second member. This inner wall may be an inclined planar wall, but it may also be provided with a curvature. It is essential that the curvature allows the two surfaces to slide against one another in order to release the first member 1.

When the marker is to be secured to an article, the steel pin 1 of the first member is stuck through the article, e.g. in a sewing or a seam in a garment and pressed into an opening in the uppermost portion of the second member and further into the cavity downwards and past the projection 10. As a result, the disc 9 with the projection 10 is pressed a short distance downwards against the force of the spring 11. The projection 10 fastens fixedly to the pin 1 of the first member, the pin thereby being retained. Attempts to pull out the first member 1 result in that the pin transfers the movement to the projection 10 and the disc 9. The inclined surface of the projection 10 and the corresponding surface on the upper portion 5 of the second member now cause the projection to be pressed even more firmly onto the pin of the first member whereas the cavity restricts the movement of the disc 9 and the projection upwards and thereby the movement of the first member. Opposite the inclined surface in the upper portion of the second member, the second member may be reinforced by an extra hard wall 15, e.g. of hard metal, such as brass. In this manner this wall is prevented from giving in to the pressure that it can be subjected to when it is tried to wriggle the first member so as to tear it off. The pin or the rod 1 of the first member may be a completely smooth rod, but it is preferably provided with circumferential grooves or narrowings engaging the projection 10 of the third member.

The lock is released by the third member 8, i.e. the disc 9 with the projection 10, being pressed or pulled downwards against the force of the spring 11. This procedure can be carried out by positioning the marker over a magnet, the magnetic field of which pulls down the steel disc 9. One or optionally several compound cobalt magnets may be used as magnet. As an alternative, the lock may be opened by inserting a needle 18 or a U-shaped hoop downwards into one or two openings provided for this purpose in the upper portions 3, 5 in such a manner that the disc 9 can be pressed downwards as indicated in Figure 3. Such openings should be shaped as discrete as possible and for instance be covered by a mark as an insurance against burglary.

According to a particularly advantageous embodiment, the resilient flap 11 has been replaced by a substantially U-shaped tongue 19 communicating with the member 8 in two points 17. This tongue presses the disc 9 with the projection 10 upwards in the same manner as the flap 11. As a consequence of the broader support along the rectilinear rim 20 of the U-shaped tongue, the disc 9 cannot tilt transversely to the longitudinal axis of the U. Furthermore, the U-shaped tongue cannot be hit and damaged by a steel pin 1.

Claims

1. A lock preferably for a burglar alarm for marking articles for sale, said lock comprising two members automatically interengaging when one member (1) is inserted in a cavity (7) in the other

member (5, 6) wherein said first member (1) comprises a rod-shaped body, the inserting end of which is completely or partially pointed, said rod-shaped body engaging a third member (8) loosely inserted in the cavity (7) in the second member, wherein a spring with an upward elastic force is situated in the cavity below the loosely inserted third member, and wherein the inner sides of the cavity incline towards the inlet of the cavity (7), the third member (8) being provided with means adapted to cooperate with a corresponding inner surface of the second member (5, 6) on one side and to engage the rod-shaped body on another side so as to be pressed against said body in case the latter is subjected to a pull, characterized in that said means consists of an oblique upward projection (10) integral with the third member (8) and inclined so as to be slidable along said inclined inner surface of the second member (5, 6), said projection (10) being provided at the top with a bending forming a barb (16) and the rod-shaped body of the first member (1) comprising a notch (2) cooperating with the rim of the barb (16).

2. A lock as claimed in claim 1, characterized by the third member (8) being of a magnetizable material and the second member (5, 6) being of a non-magnetizable material such as plastics.

3. A lock as claimed in claim 1, characterized by the top side (5) of the second member being provided with openings allowing the third member (8) to be pressed into the cavity (7) by means of an implement in such a manner that the first member (1) can be removed from the lock.

4. A lock as claimed in claim 1, characterized by the inner side of the cavity (7) in the second member (5) being reinforced opposite the inclined surface by means of a hard material such as for instance a brass plate (15).

5. A lock as claimed in claim 1, characterized by the third loosely positioned member (8) being shaped as a disc with an inclined upward projection (10) pressed up from the disc.

6. A lock as claimed in claim 5, characterized by the rim of the barb (16) towards the first member (1) being shaped as part of a circular arc with a radius fitting the radius of the rod-shaped body of the first member (1).

7. A lock as claimed in claim 1, characterized by the second member comprising two ultrasonically welded plastic portions, viz. an upper portion (5) and a lower portion (6), and by the lower portion being cast with an upwardly inclined plastic flap forming the spring (11) supporting the loosely positioned third member (8).

8. A lock as claimed in claim 7, characterized by the flap (11) being a substantially U-shaped tongue (19).

Patentansprüche

1. Schloß, vorzugsweise zur Diebstahlssicherung von Waren, mit zwei Teilen, die automatisch ineinandergreifen, wenn ein Teil (1) in einen Hohlraum (7) im anderen Teil (5, 6) eingesetzt wird, bei dem das erste Teil (1) einen stabförmigen Körper aufweist, dessen Einsetzende völlig oder teilweise spitz ist, der stabförmige Körper ein drittes Teil (8) erfaßt, das lose in dem Hohlraum (7) in dem zweiten Teil eingesetzt ist, eine Feder mit nach oben gerichteter Federkraft in dem Hohlraum unter dem lose eingesetzten dritten Teil angeordnet ist, die Innenseiten des Hohlraums zum Einlaßende des Hohlraums (7) hin geneigt sind, das dritte Teil (8) mit Mitteln versehen ist, die mit einer entsprechenden Innenfläche des zweiten Teils (5, 6) einerseits zusammenwirken und den stabförmigen Körper andererseits erfassen, um gegen den Körper gedrückt zu werden, wenn daran gezogen wird, dadurch gekennzeichnet, daß die Mittel aus einem schrägen nach oben gerichteten Vorsprung (10) bestehen, der einstückig mit dem dritten Teil (8) ausgebildet und geneigt ist, um auf der geneigten Innenfläche des zweiten Teils (5, 6) entlangzugleiten, daß der Vorsprung (10) am oberen Ende mit einer einen Widerhaken (16) bildenden Krümmung versehen ist und daß der stabförmige Körper des ersten Teils (1) eine Nut (2) aufweist, die mit dem Rand des Widerhakens (16) zusammenwirkt.

2. Schloß nach Anspruch 1, dadurch gekennzeichnet, daß das dritte Teil (8) aus einem magnetisierbaren Material und das zweite Teil (5, 6) aus einem nichtmagnetisierbaren Material wie zB Kunststoff besteht.

3. Schloß nach Anspruch 1, dadurch gekennzeichnet, daß die Oberseite (5) des zweiten Teils mit Öffnungen versehen ist, durch die das dritte Teil (8) in den Hohlraum (7) mittels eines Werkzeugs so hineindrückbar ist, so daß das erste Teil (1) aus dem Schloß entfernbar ist.

4. Schloß nach Anspruch 1, dadurch gekennzeichnet, daß die Innenseite des Hohlraums (7) im zweiten Teil (5) gegenüber der geneigten Fläche mittels eines harten Materials wie zB einer Messingscheibe (15) verstärkt ist.

5. Schloß nach Anspruch 1, dadurch gekennzeichnet, daß das lose positionierte dritte Teil (8) als Scheibe mit einem geneigten nach oben gerichteten Vorsprung (10) ausgebildet ist, der aus der Scheibe herausgepreßt ist.

6. Schloß nach Anspruch 5, dadurch gekennzeichnet, daß der auf das erste Teil (1) hin gerichtete Rand des Widerhakens (16) als Teil eines Kreisbogens mit einem Radius ausgebildet ist, der dem Radius des stabförmigen Körpers des ersten Teils (1) entspricht.

7. Schloß nach Anspruch 1, dadurch gekennzeichnet, daß das zweite Teil zwei ultraschallverschweißte Kunststoffabschnitte, nämlich einen oberen Abschnitt (5) und einen unteren Abschnitt (6) aufweist und daß der untere Abschnitt mit einer nach oben geneigten Kunststoff-Lasche gegossen ist, die die Feder (11) bildet, die das lose positionierte dritte Teil (8) abstützt.

8. Schloß nach Anspruch 7, dadurch gekennzeichnet, daß die Lasche (11) eine im wesentlichen U-förmige Zunge (19) ist.

Revendications

1. Serrure de préférence pour une signalisation d'antivol, destinée à marquer un article pour la vente, cette serrure comprenant deux éléments d'enclenchant automatiquement lorsqu'un élément (1) est introduit dans une cavité (7) de l'autre élément (5, 6), serrure dans laquelle le premier élément (1) comprend un corps en forme de tige dont l'extrémité d'introduction est complètement ou partiellement taillée en pointe, ce corps en forme de tige s'engageant dans un troisième élément (8) introduit avec jeu dans la cavité (7) du second élément, dans laquelle un ressort présentant une force élastique dirigée vers le haut, est placé dans la cavité au-dessous du troisième élément introduit avec jeu, et dans laquelle les côtés intérieurs de la cavité s'inclinent vers l'entrée de cette cavité (7), le troisième élément (8) étant muni de moyens destinés à coopérer d'un côté avec une surface intérieure correspondante du second élément (5, 6), et à s'engager de l'autre côté contre le corps en forme de tige, de manière à être poussé contre ce corps, lorsque celui-ci est soumis à une traction, serrure caractérisée en ce que les moyens du troisième élément sont constitués par une projection (10) dirigée obliquement vers le haut, faisant corps avec le troisième élément (8), et incliné de manière à pouvoir glisser le long de la surface intérieure inclinée du second élément (5, 6), cette projection (10) étant munie dans le haut d'une partie courbe formant barbe de crochet (16), et le corps en forme de tige du premier élément (1) comprenant une encoche (2) coopérant avec le rebord de la barbe (16).

2. Serrure selon la revendication 1, caractérisée en ce que le troisième élément (8) est en matériau magnétisable, et en ce que le second élément (5, 6) est en matériau non magnétisable comme par exemple une matière plastique.

3. Serrure selon la revendication 1, caractérisée en ce que le côté supérieur (5) du second élément est muni d'ouvertures permettant au troisième élément (8) d'être poussé dans la cavité (7) au moyen d'un outil, de façon que le premier élément (1) puisse être retiré de la serrure.

4. Serrure selon la revendication 1, caractérisée en ce que le côté intérieur de la cavité (7) du second élément (5) est renforcé, du côté opposé à la surface inclinée, par un matériau dur tel que par exemple une plaque de laiton (15).

5. Serrure selon la revendication 1, caractérisée en ce que le troisième élément monté avec jeu (8) est réalisé sous la forme d'un disque comportant une projection inclinée vers le haut (10) emboutie vers le haut par rapport au disque.

6. Serrure selon la revendication 5, caractérisée en ce que le rebord de la barbe de crochet (16) dirigé vers le premier élément (1), est réalisé sous la forme d'une partie d'arc de cercle présentant un rayon correspondant à celui du corps en forme de tige du premier élément (1).

7. Serrure selon la revendication 1, caractérisée en ce que le second élément comprend deux parties de matière plastique soudées aux ultrasons, c'est-à-dire une partie supérieure (5) et une partie inférieure (6), en ce que la partie inférieure est moulée avec une patte de matière plastique inclinée vers le haut constituant le ressort (11) destinée à supporter le troisième élément monté avec jeu (8).

8. Serrure selon la revendication 7, caractérisée en ce que la patte (11) se présente sous la forme d'une languette (19) essentiellement en forme de U.

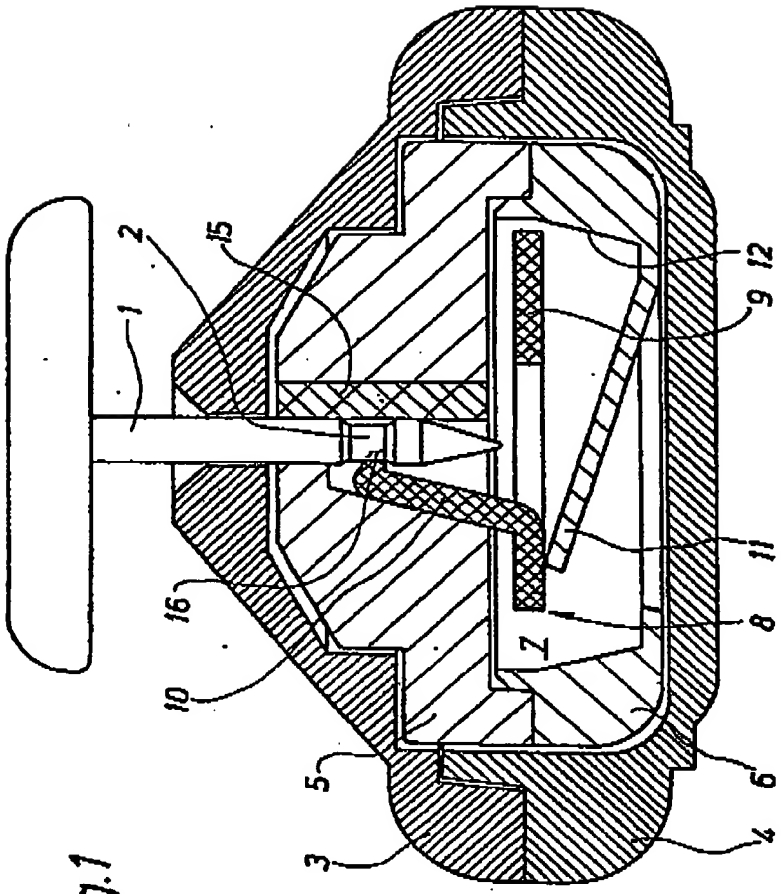

Fig.1

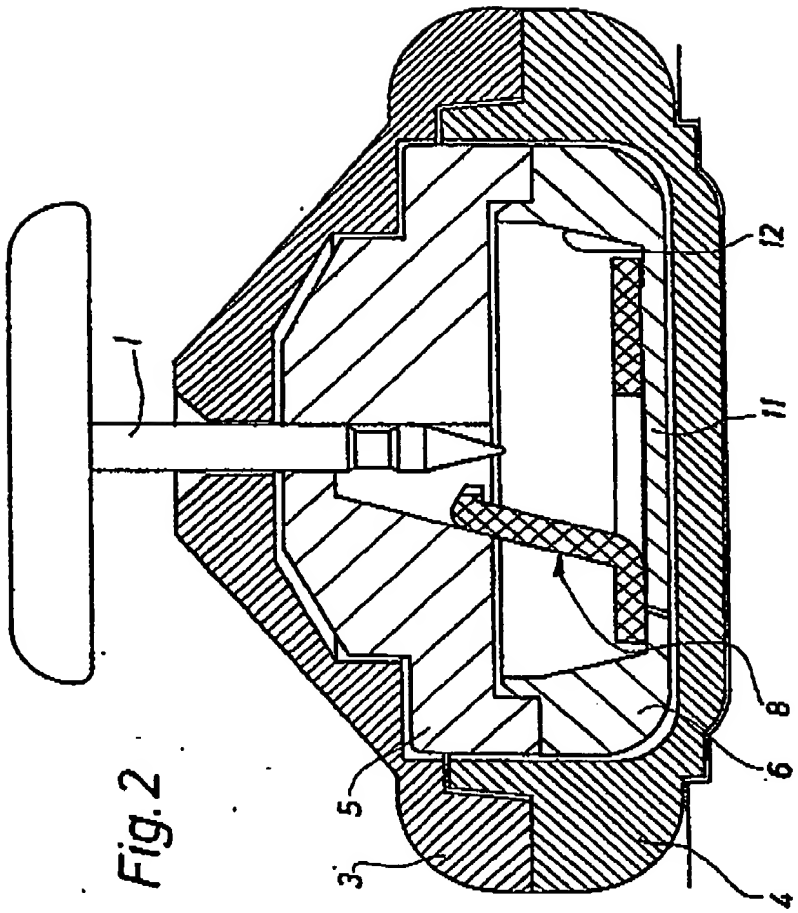

Fig. 2

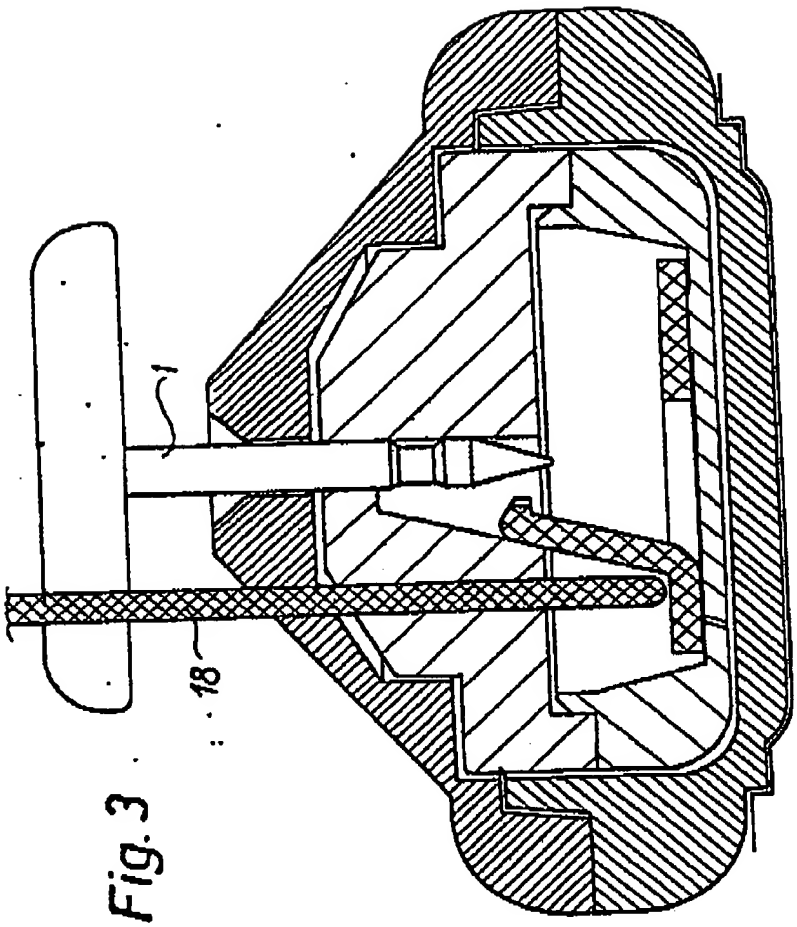

Fig. 3

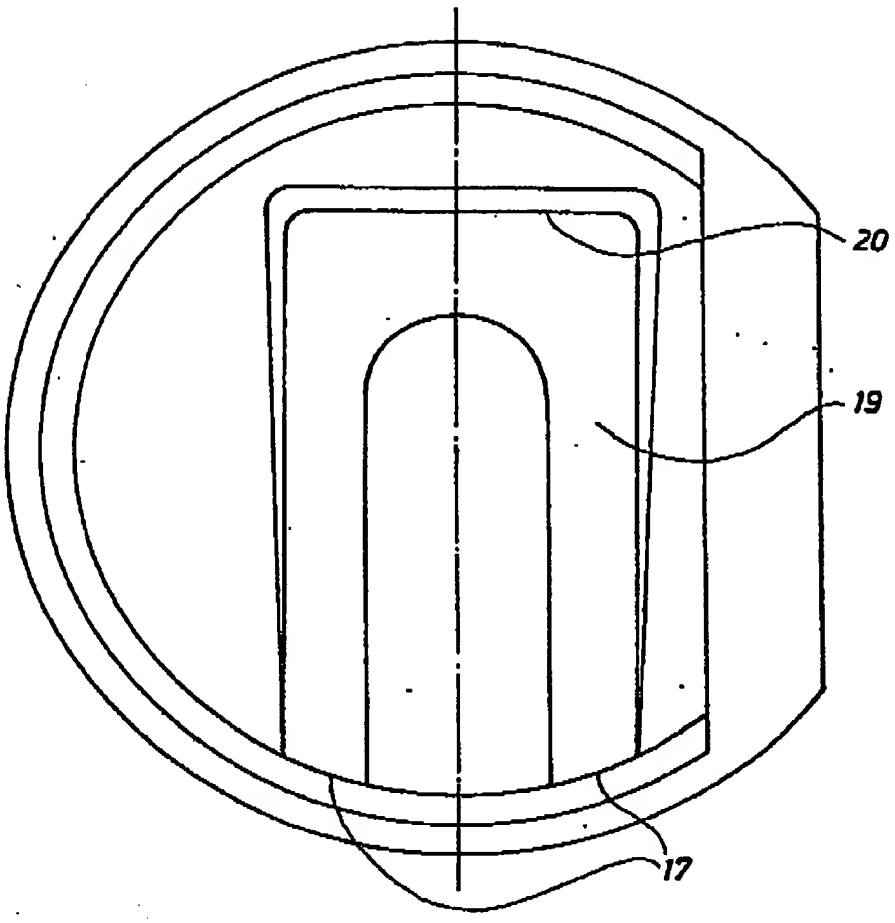

Fig. 5